

Name _____ Date _____ Period _____

Perform the indicated operation and write the answer in the form $a + bi$, where a and b are real numbers.

1. $(3 - 3i) + (4 + 5i)$

2. $(1 - i) - (7 + 2i)$

3. $-6i(2 - 4i)$

4. $(2 - 3i)(4 + 6i)$

5. $(\sqrt{3} - i)(\sqrt{3} + i)$

6. $(4 - 9i)^2$

Evaluate.

7. i^{17}

8. i^{36}

9. i^{22}

10. i^{47}

Find the product of the complex number and its conjugate.

11. $(5 + 9i)$

12. $-4i$

13. $(-10 + 3i)$

14. $(8 - i)$

Write the quotient in the form $a + bi$.

15. $\frac{1}{7+2i}$

16. $\frac{3i}{2-i}$

17. $\frac{8-3i}{5i}$

18. $\frac{(1+i)}{-2i}$

19. $\frac{-5+2i}{7+2i}$

20. $\frac{7-6i}{-9-12i}$

21. $\frac{-3i}{4+5i}$

22. $\frac{1-i}{1+i}$

23. $\frac{-8}{-2i}$

Write the expression in the form $a + bi$, where a and b are real numbers.

24. $\sqrt{15} \cdot \sqrt{10}$

25. $\sqrt{-4} \cdot \sqrt{-9}$

26. $\sqrt{-6} \cdot \sqrt{-6}$

$$27. \sqrt{-2} \cdot \sqrt{-50}$$

$$28. \frac{-2 + \sqrt{-20}}{2}$$

$$29. \frac{-1 + \sqrt{-18}}{3}$$

$$30. \frac{-10 + \sqrt{-5}}{2}$$

$$31. \frac{-2 + \sqrt{10}}{2 + \sqrt{5}}$$

$$32. \frac{-2 + \sqrt{-2}}{1 - \sqrt{-2}}$$

Review.

Identify the zeros of the function and the x-intercepts of its graph. Write the polynomial in standard form. Show work!

$$33. f(x) = (x-1)(x+2i)(x-2i)$$

zeros: _____

x-intercept(s): _____

standard form: _____

Find all complex zeros of each polynomial. Write the function in factored form. (Hint: $\frac{p}{q}$) Show work!

$$34. f(x) = x^3 - 6x^2 + 7x + 4$$